Delaware Electric Cooperative
Generator Interconnection Application –Long Form
(For Use with Generators Greater than 100 kW)

An applicant (Generator Owner) makes application to Delaware Electric Cooperative to install and operate a generating facility greater than 100 kW interconnected with the Delaware Electric Cooperative utility system.

Section 1, Applicant Information Directly Interconnected to the Generating System

Is the following system: ☐ **Leased** **or** ☒ **Member Owned**

Type of Application: ☒ **Initial** **or** ☐ **Addition/Upgrade**

Name: Christopher J Lesniowski

Mailing Address: 232 Westville Rd.

City: Marydel State: DE ZipCode: 19964

Email Address: chris@hdmyles.com

Facility Location (if different from above): _____

Telephone: Area Code 443 Number 480-9289 (Cell) Area Code ____ Number _____

Delaware Electric Cooperative Account No.: New service for solar Rate Code: _____

Acnt. # 12309700 1P1
Acnt. # 12309600 5P1

Section 2, Equipment Contractor

Name: Sunrise Solar, Inc. Attn: Dan Baugher

Mailing Address: PO Box 898

City: Chestertown State: MD ZipCode: 21620

Email Address: dan@sunrisesolarmd.com Telephone (Daytime): Area Code 410 Number 708-4824

Section 3, General Service Requirements

If different from the existing service, what size service will the generation facility require?

☐ 200A ☐ 400A ☐ 600A ☐ 800A ☒ Primary Metered

If this is a new account for a Solar System, what Voltage/Phase will be required?

☒ 120/240V-1Ph ☐ 120/208V-1Ph ☐ 120/208V-3Ph ☐ 277/480V-3Ph

Section 4, Application Fee

This application fee is applicable for all new PV applications received on or after May 20, 2016. The cost will be $50.00 per application (new and/or upgrade) for systems 25 kW DC or less. For systems over 25 kW DC the fee will be $50.00 plus $1.00 kW DC over 25 kW DC. All interconnection applications submitted to DEC shall be accompanied with the appropriate fee made out to Delaware Electric Cooperative and are non-refundable. No applications will be considered without the fee.

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Section 5, Generator Type

Is Generator powered from a Renewable Energy Source: [X] Yes [ ] No

Type of Energy Source (if applicable): [X] Solar [ ] Wind [ ] Other

Other generator energy source: [ ] Diesel, Natural Gas [ ] Diesel, Fuel Oil [ ] Other: _____

Will excess power be exported to Delaware Electric Cooperative? Yes [X] No [ ]

Total Aggregated Maximum Load: 245.7 kw DC kW DC/AC (Typical) Maximum Export: 195 kw AC kW DC/AC

Forecast Annual kWh: 339,000 (Note: The Annual Forecast MUST be completed using **4.5 peak sun light hours per days**)

Section 6, Generator Technical Information

Please fill out the Initial Rating information if there is currently no generating facility on-site. If adding a generating facility to an existing facility, fill out the Initial Rating Information, the Added Rating Information and the Total Rating Information

Type of Generator: [ ] Synchronous [ ] Induction [X] DC Generator or Solar with Inverter

Generator (or solar collector) Manufacturer, Model Name & Number: Sunpower P-350 - (702)
(A copy of Generator Nameplate and Manufacturer's Specification Sheet may be substituted)

Inverter Manufacturer, Model Name & Number (if used): Fronius 15 kw - (13 total)
(A copy of Inverter Nameplate and Manufacturer's Specification Sheet may be substituted)

Nominal Voltage Setting 440 (V) Max Reconnect Voltage Setting 480 (V)

Initial Rating:
DC System Design Capacity: 245.7 (kW) 245.7 (kVA)
Inverter Capacity: 195 (Maximum AC kW)
AC System Design Capacity: 195 (kW) 195 (kVA)

Added Rating:
DC System Design Capacity: _____ (kW) _____ (kVA)
Inverter Capacity: _____ (Maximum AC kW)
AC System Design Capacity: _____ (kW) _____ (kVA)

Total Rating (Existing and New):
DC System Design Capacity: _____ (kW) _____ (kVA)
Inverter Capacity: _____ (Maximum AC kW)
AC System Design Capacity: _____ (kW) _____ (kVA)

Generator Characteristic Data (for rotating machines):
(Not needed if Generator Nameplate and Manufacture's Specification Sheet is provided)

Direct Axis Synchronous Reactance, X_d: _____ P.U. Negative Sequence Reactance: _____ P.U.
Direct Axis Transient Reactance, X'_d: _____ P.U. Zero Sequence Reactance: _____ P.U.
Direct Axis Subtransient Reactance, X''_d: _____ P.U. kVA Base: _____

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Section 7, Interconnecting Equipment Technical Data

Will an interposing transformer be used between the generator and the point of interconnection? ☐ Yes ☐ No

Transformer Data (if applicable, for Customer Owned Transformer):
(A copy of transformer Nameplate and Manufacturer's Test Report may be substituted)

Size: _____ KVA . Transformer Primary : _____ Volts ☐ Delta ☐ Wye ☐ Wye Grounded

Transformer Secondary: _____ Volts ☐ Delta ☐ Wye ☐ Wye Grounded

Transformer Impedance: _____% on _____ KVA Base

Transformer Fuse Data (if applicable, for Customer Owned Fuse):
(Attach copy of fuse manufacturer's Minimum Melt & Total Clearing Time-Current Curves)

Manufacturer: _____ Type: _____ Size: _____ Speed: _____

Interconnecting Circuit Breaker (if applicable):
(A copy of breaker's Nameplate and Specification Sheet may be substituted)

Manufacturer: _____ Type: _____ Load Rating: _____ (Amps) Interrupting Rating: _____ (Amps) Trip Speed: _____ (Cycles)

Circuit Breaker Protective Relays (if applicable):
(Enclose copy of any proposed Time-Overcurrent Coordination Curves)

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting:_____

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting: _____

Manufacturer: _____ Type: _____ Style/Catalog No.: _____ Proposed Setting:_____

Current Transformer Data (if applicable):
(Enclose copy of Manufacturer's Excitation & Ratio Correction Curves)

Manufacturer: _____ Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____/5

Manufacturer: _____ Type: _____ Accuracy Class: _____ Proposed Ratio Connection: _____/5

Generator Disconnect Switch:
A **lockable** disconnect device shall be installed within 3 feet of the DEC meter and accessible at all times by DEC personnel, by and at the cost of the owner.

Manufacturer: _____ Type: _____ Catalog No.: _____ Rated Volts: _____ Rated Amps:_____

Single or 3 Phase: _____ Mounting Location: _____

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Section 8, General Technical Information

Enclose copy of site One-Line Diagram showing configuration and interconnection of all equipment, current and potential circuits and protection and control schemes. Is One-Line Diagram Enclosed?: Yes ☐

Enclose copy of any site documentation that describes and details the operation of the protection and control schemes. Is Any Available Documentation Enclosed?: Yes ☐

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits. Are Schematic Drawings Enclosed?: Yes ☐

Section 9, Aggregated Meter Information (If Applicable)

The following aggregated accounts shall be ranked according to the order in which credits shall be applied (We don't apply the credit; however, DEC may elect to make payment to the account serving the Generating System) Additionally, the following accounts must be active accounts and will be used to determine the total 2-year Annual Average kWh to ensure the new system is in compliance with DEC tariff.

1 - DEC Member Name Christopher J Lesniowski Rate Code: 1P1

DEC Account No.: 12309700 Capacity (DEC): _____ 2 Yr Annual Average kWh: 104,000

2 - DEC Member Name Christopher J Lesniowski Rate Code: 5P1

DEC Account No.: 12309600 Capacity (DEC): _____ 2 Yr Annual Average kWh: 232,000

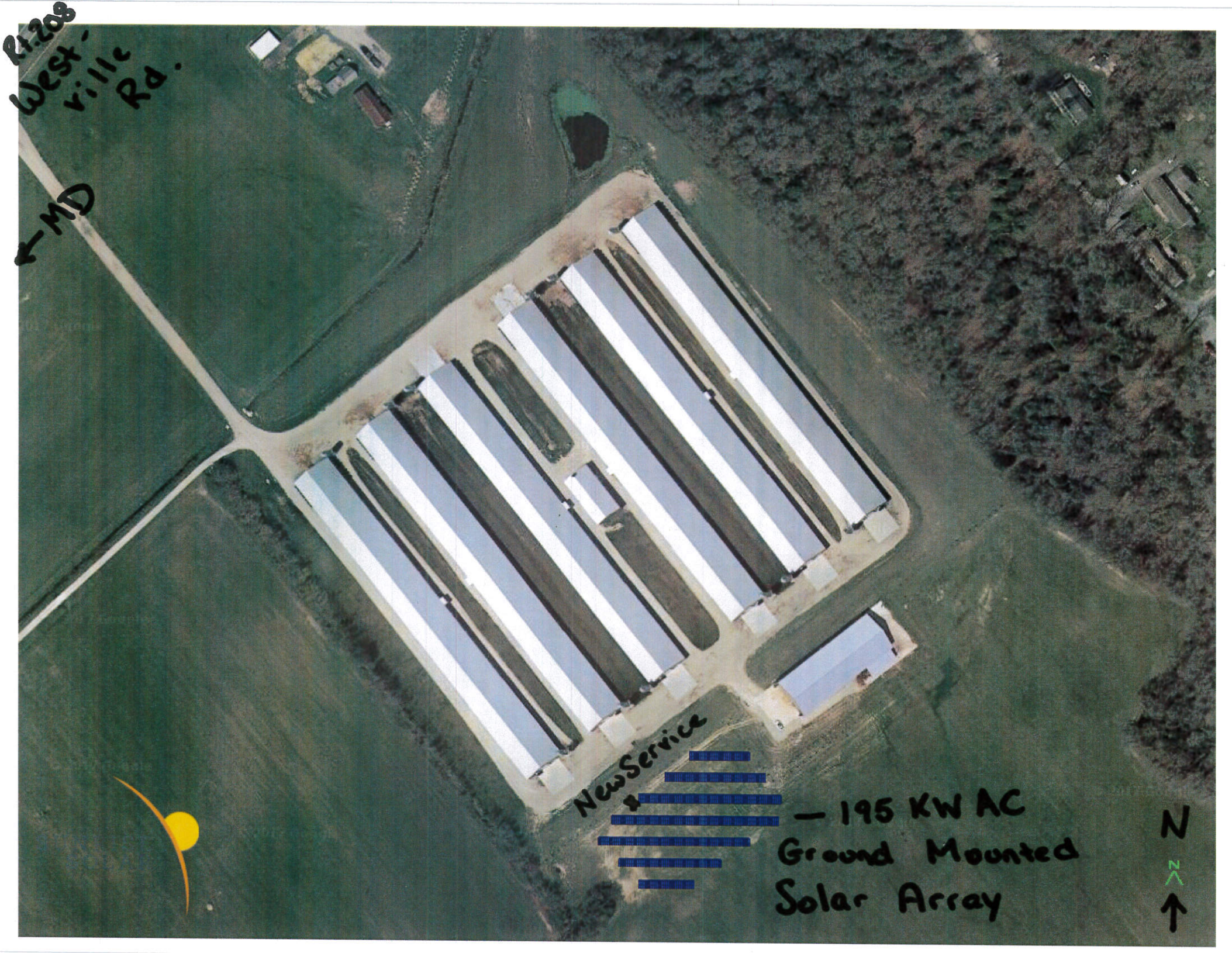
3 - DEC Member Name _____ Rate Code: _____

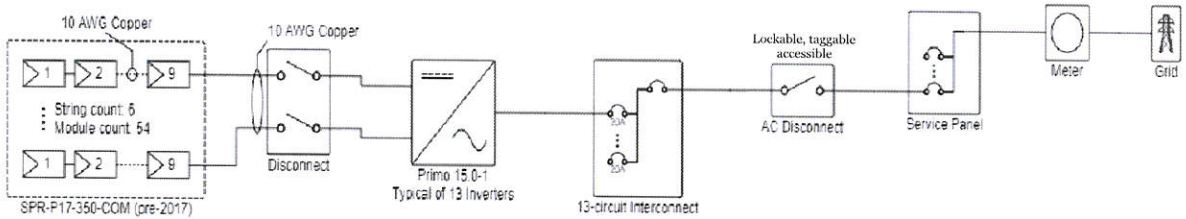
DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

4 - DEC Member Name _____ Rate Code: _____

DEC Account No.: _____ Capacity (DEC): _____ 2 Yr Annual Average kWh: _____

Any additional meters associated with this aggregated system must be supplied on a separate sheet in the same format.


Rt. 208
West-
ville
Rd.
← MD
New Service
— 195 KW AC
Ground Mounted
Solar Array
N



Module Specifications	
702x SunPower SPR-P17-350-COM (pre-2017)	
STC Rating	350 W
Vmp	43.1 V
Imp	8.12 A
Voc	51.7 V
Isc	8.65 A

Inverter Specifications	
13x Fronius Primo 15.0-1	
Max AC Power Rating	15 kW
Max Input Voltage	600 V
Min AC Power Rating	0 W
Min Input Voltage	80 V

Wire Schedule		
Tier	Wire	Length
String	78x 10 AWG	8211ft

Chris Lesniowski
232 Westville Rd
Marydel, DE 19964

SUNRISE SOLAR

Sunrise Solar Inc.
6408 Church Hill Rd
Chestertown, MD 21620

December 19, 2017

/ Perfect Welding / Solar Energy / Perfect Charging

SHIFTING THE LIMITS

FRONIUS PRIMO

/ The future of residential solar is here - Introducing the new Fronius Primo.

/ With power categories ranging from 3.8 kW to 15.0 kW, the transformerless Fronius Primo is the ideal compact single-phase inverter for residential applications. The sleek design is equipped with the SnapINverter hinge mounting system which allows for lightweight, secure and convenient installation. The Fronius Primo has several integrated features that set it apart from competitors including dual powerpoint trackers, high system voltage, a wide input voltage range, Wi-Fi* and SunSpec Modbus interface, and Fronius' online and mobile monitoring platform Fronius Solar.web. The Fronius Primo also works seamlessly with the Fronius Rapid Shutdown Box for a reliable NEC 2014 solution** and offers a Revenue Grade Metering option completely integrated.

TECHNICAL DATA FRONIUS PRIMO

GENERAL DATA	FRONIUS PRIMO 3.8 - 8.2	FRONIUS PRIMO 10.0-15.0
Dimensions (width x height x depth)	16.9 x 24.7 x 8.1 in.	20.1 x 28.5 x 8.9 in.
Weight	47.29 lb.	82.5 lbs.
Degree of protection	NEMA 4X	
Night time consumption	< 1 W	
Inverter topology	Transformerless	
Cooling	Variable speed fan	
Installation	Indoor and outdoor installation	
Ambient operating temperature range	-40 - 131°F (-40 - 55°C)	-40 - 140°F (-40 - 60°C)
Permitted humidity	0 - 100 %	
DC connection terminals	4x DC+ and 4x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminum (solid / stranded)	4x DC+1, 2x DC+2 and 6x DC- screw terminals for copper (solid / stranded / fine stranded) or aluminum (solid / stranded)
AC connection terminals	Screw terminals 12 - 6 AWG	
Revenue Grade Metering	Optional (ANSI C12.1 accuracy)	
Certificates and compliance with standards	UL 1741-2010, UL1998 (for functions: AFCI and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690, C22. 2 No. 107.1-01 (September 2001) , UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013	UL 1741-2015, UL1998 (for functions: AFCI, RCMU and isolation monitoring), IEEE 1547-2003, IEEE 1547.1-2003, ANSI/IEEE C62.41, FCC Part 15 A & B, NEC Article 690-2014, C22. 2 No. 107.1-01 (September 2001) , UL1699B Issue 2 -2013, CSA TIL M-07 Issue 1 -2013

PROTECTIVE DEVICES	STANDARD WITH ALL PRIMO MODELS
AFCI & 2014 NEC Ready	Yes
Ground Fault Protection with Isolation Monitor Interrupter	Yes
DC disconnect	Yes
DC reverse polarity protection	Yes

INTERFACES	STANDARD WITH ALL PRIMO MODELS
Wi-Fi*/Ethernet/Serial	Wireless standard 802.11 b/g/n / Fronius Solar.web, SunSpec Modbus TCP, JSON / SunSpec Modbus RTU
6 inputs or 4 digital inputs/outputs	External relay controls
USB (A socket)	Datalogging and/or updating via USB
2x RS422 (RJ45 socket)	Fronius Solar Net, interface protocol
Datalogger and Webserver	Included

*The term Wi-Fi® is a registered trademark of the Wi-Fi Alliance.

**Fronius Primo 10.0-15.0 kW requires an external disconnect button for code compliance.

TECHNICAL DATA FRONIUS PRIMO

INPUT DATA	PRIMO 3.8-1	PRIMO 5.0-1	PRIMO 6.0-1	PRIMO 7.6-1	PRIMO 8.2-1
Recommended PV power (kWp)	3.0 - 6.0 kW	4.0 - 7.8 kW	4.8 - 9.3 kW	6.1 - 11.7 kW	6.6 - 12.7 kW
Max. usable input current (MPPT 1/MPPT 2)	18 A / 18 A	18 A / 18 A	18 A / 18 A	18 A / 18 A	18 A / 18 A
Total max. DC current	36 A				
Max. array short circuit current (1.25 Imax) (MPPT 1/MPPT 2)	22.5 A / 22.5 A				
Operating voltage range	80 V - 600 V				
Max. input voltage	600 V				
Nominal input voltage	410 V	420 V	420 V	420 V	420 V
Admissable conductor size DC	AWG 14 - AWG 6				
MPP Voltage Range	200 - 480 V	240 - 480 V	240 - 480 V	250 - 480 V	270 - 480 V
Number of MPPT	2				

OUTPUT DATA		PRIMO 3.8-1	PRIMO 5.0-1	PRIMO 6.0-1	PRIMO 7.6-1	PRIMO 8.2-1
Max. output power	240 V	3800 W	5000 W	6000 W	7600 W	8200 W
	208 V	3800 W	5000 W	6000 W	7600 W	7900 W
Max. continuous output current	240 V	15.8 A	20.8 A	25.0 A	31.7 A	34.2 A
	208 V	18.3 A	24.0 A	28.8 A	36.5 A	38.0 A
Recommended OCPD/AC breaker size	240 V	20 A	30 A	35 A	40 A	45 A
	208 V	25 A	30 A	40 A	50 A	50 A
Max. Efficiency		96.7 %	96.9 %	96.9 %	96.9 %	97.0 %
CEC Efficiency	240 V	95.0 %	95.5 %	96.0 %	96.0 %	96.5 %
Admissable conductor size AC		AWG 14 - AWG 6				
Grid connection		208 / 240 V				
Frequency		60 Hz				
Total harmonic distortion		< 5.0 %				
Power factor ($\cos \varphi_{ac,r}$)		0.85-1 ind./cap				

INPUT DATA	PRIMO 10.0-1	PRIMO 11.4-1	PRIMO 12.5-1	PRIMO 15.0-1
Recommended PV power (kWp)	8.0 - 12.0 kW	9.1 - 13.7 kW	10.0 - 15.0 kW	12.0 - 18.0 kW
Max. usable input current (MPPT 1/MPPT 2)	33.0 A / 18.0 A			
Total max. DC current	51 A			
Max. array short circuit current (1.25 Imax) (MPPT 1/MPPT 2)	41.3 A / 22.5 A			
Operating voltage range	80 V - 600 V			
Max. input voltage	600 V			
Nominal input voltage	415 V	420 V	425 V	440 V
Admissable conductor size DC	AWG 14 - AWG 6 copper direct, AWG 6 aluminum direct (AWG 10 copper or AWG 8 aluminium for overcurrent protective devices up to 60A, from 61 to 100A minimum AWG 8 for copper or AWG 6 aluminium has to be used), AWG 4 - AWG 2 copper or aluminum with optional input combiner			
MPP Voltage Range	220 - 480 V	240 - 480 V	260 - 480 V	320 - 480 V
Integrated DC string fuse holders	4- and 4+ for MPPT 1 / no fusing required on MPPT 2			
Number of MPPT	2			

OUTPUT DATA		PRIMO 10.0-1	PRIMO 11.4-1	PRIMO 12.5-1	PRIMO 15.0-1
Max. output power	240 V	9995 W	11400 W	12500 W	15000 W
	208 V	9995 W	11400 W	12500 W	13750 W
Max. continuous output current	240 V	41.6 A	47.5 A	52.1 A	62.5 A
	208 V	48.1 A	54.8 A	60.1 A	66.1 A
Recommended OCPD/AC breaker size	240 V	60 A	60 A	70 A	80 A
	208 V	70 A	70 A	80 A	90 A
Max. Efficiency		96.7 %			
CEC Efficiency		96.0 %			96.5 %
Admissable conductor size AC		AWG 10 - AWG 2 copper (solid / stranded / fine stranded)(AWG 10 copper or AWG 8 aluminium for overcurrent protective devices up to 60A, from 61 to 100A minimum AWG 8 for copper or AWG 6 aluminium has to be used) , AWG 6 - AWG 2 copper(solid / stranded) MultiContactWiringable with AWG 12			
Grid connection		208 / 240 V			
Frequency		60 Hz			
Total harmonic distortion		< 2.5 %			
Power factor ($\cos \varphi_{ac,r}$)		0-1 ind./cap.			

/ Perfect Welding / Solar Energy / Perfect Charging

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,300 employees worldwide, we shift the limits of what's possible - our record of over 900 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at **www.fronius.com**

v05 May 2015 EN

Fronius USA LLC
6797 Fronius Drive
Portage, IN 46368 USA
pv-support-usa@fronius.com
www.fronius-usa.com

SunPower® Performance Series | P17

Performance Series panels are designed to deliver consistent performance for many years in commercial applications.

13% More Power

The Performance Series design minimizes white space between solar cells, eliminates reflective metal lines on the cells, and lowers electrical resistance between cells, increasing efficiency compared to Conventional Commercial Panels.[1]

Increased Energy

Landscape orientation maintains energy production during morning and evening row-to-row shading (or dirty conditions), generating more energy than conventional panels.[2]

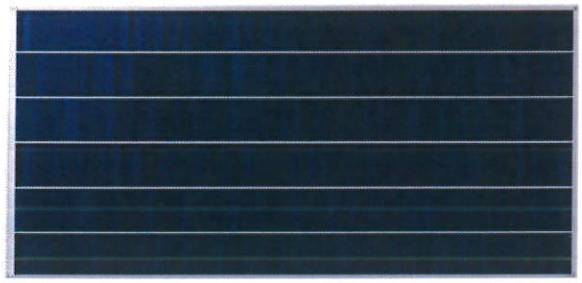
High Reliability

Innovative panel design uses flexible and redundant electrical connections between solar cells to deliver enhanced reliability.

SunPower Quality

Tested to SunPower's rigorous quality standards, and backed by the industry's best combined Power and Product Warranty.

High Performance & Excellent Reliability

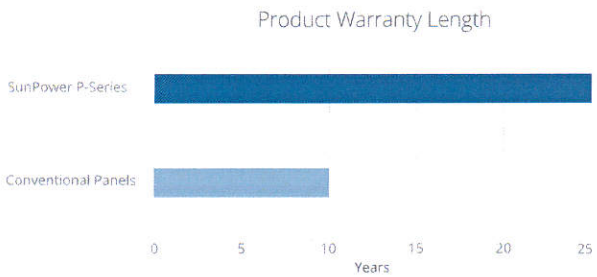


P17 SERIES

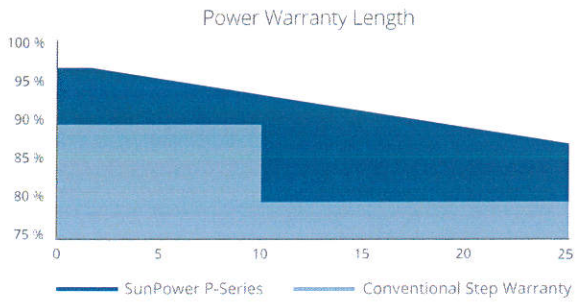
SPR-P17-355-COM

25 Year Combined Warranty

Protect your investment



SunPower provides the best 25 year product and power warranty in the industry, guaranteeing coverage regardless of product defect or power loss.



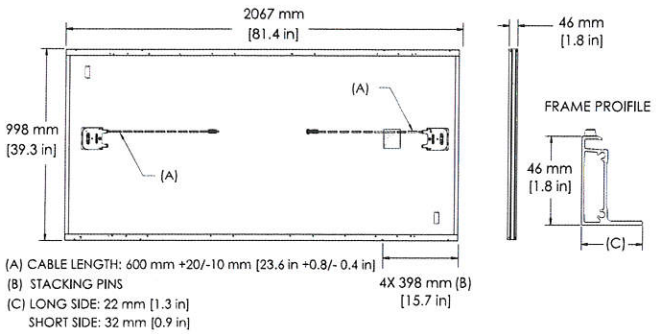
SunPower's Performance Series is warranted to produce more than 97% in the first year, then decline by 0.6% per year, ending at 82.6%.

SunPower® Performance Series | P17

Electrical Data, STC[3]					
Model	SPR-P17-355-COM	SPR-P17-350-COM	SPR-P17-345-COM	SPR-P17-340-COM	SPR-P17-335-COM
Nominal Power (Pnom)	355 W	350 W	345 W	340 W	335 W
Power Tolerance	+5/–0%	+5/–0%	+5/–0%	+5/–0%	+5/–0%
Efficiency	17.2%	17.0%	16.7%	16.5%	16.2%
Rated Voltage (Vmpp)	43.4 V	43.1 V	42.8 V	42.5 V	42.2 V
Rated Current (Impp)	8.18 A	8.12 A	8.06 A	8.00 A	7.94 A
Open-Circuit Voltage (Voc)	51.9 V	51.7 V	51.5 V	51.3 V	51.1 V
Short-Circuit Current (Isc)	8.68 A	8.65 A	8.57 A	8.52 A	8.51 A
Power Temp. Coef.			-0.42% / ° C		
Voltage Temp. Coef.	–176.5 mV / ° C	–175.8 mV / ° C	–175.1 mV / ° C	–174.4 mV / ° C	–173.7mV / ° C
Current Temp. Coef.			3.6 mA / ° C		
Maximum System Voltage			1000 V UL & 1000 V IEC		
Maximum Series Fuse			15 A		

Operating Condition and Mechanical Data	
Temperature	–40° F to +185° F (–40° C to +85° C)
Max. Load	Wind: 50 psf, 2400 Pa front & back Snow: 112 psf, 5400 Pa front
Impact Resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class B
Solar Cells	Multicrystalline cells
Tempered Glass	High-transmission tempered anti-reflective
Junction Box	IP-65, 23.6 in (600 mm) cables / MC4 compatible
Frame	Class 2 silver anodized; stacking pins
Weight	53.4 lbs. (24.2 kg)

Tests and Certifications	
Standard Tests	UL 1703 (Type 2 Fire Rating), IEC 61215, IEC 61730
Quality Certs	ISO 9001:2008, ISO 14001: 2004
EHS Compliance	OHSAS 18001:2007, PV Cycle
PID Test	Potential-Induced Degradation free: 1000 V
Available listings	UL,CEC, CSA, TUV, FSEC



(A) CABLE LENGTH: 600 mm +20/-10 mm [23.6 in +0.8/- 0.4 in]
(B) STACKING PINS
(C) LONG SIDE: 22 mm [1.3 in]
SHORT SIDE: 32 mm [0.9 in]

1 Compared to a Conventional Commercial Panel (310 W, 16% efficient, approx. 1.93 m²)
2 Conventional panels produce 66% power with more than 10 cm of shade along the bottom edge, while P-Series produces 92%.
3 Measured at Standard Test Conditions (STC): irradiance of 1000 W/m², AM 1.5, and cell temperature 25° C. All DC voltage is fully contained within the module.

sunpower.com
Read safety and installation instructions before using this product.

Document # 516031 Rev C / LTR_US

SUNPOWER®